

1 X 600Watt Class D Audio Amplifier Board – TAS5630 User's Guide

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Note:

Please read this manual carefully before you use the product. To keep the product in a best working condition and having a long service time, please operate it according to the relevant steps. The warranty lapses if the product is damaged because of incorrect use and your negligence.

Please read this manual carefully before you use the product and check if the product is a good one. DC50V is recommended to be used to power the product for one hour. Please make sure there's space for heat dissipation since this product outputs high power and don't touch the heat sink with your hand. Never use this product in an extreme condition.

Warning: Never immerse the product in the rain or any other humid environment to prevent the fire or electric shock.

Safety Precautions:

1. In order to achieve a better sound quality, please use stable power supply since a bad or unstable power supply may worsen the sound quality or even cripple the amplifier board.
2. Avoid metal objects. Protect this product well and move away metal objects from this product.



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NOTES:

Product Version : Ver 1.0

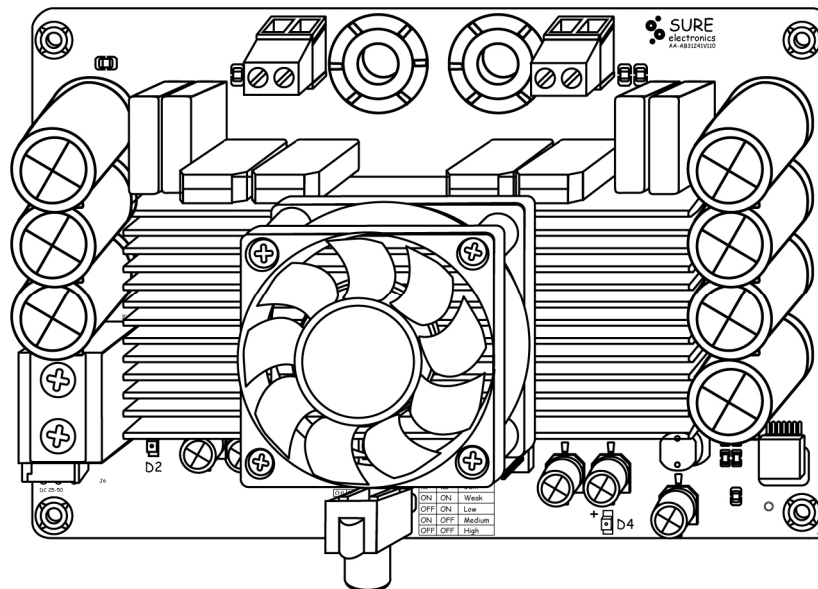
Document Version : Ver 1.0

Chapter 1. Overview

1.1 Overview

Welcome to use this 1*600W Class-D audio amplifier board series by Sure Electronics. It integrates TI's high performance TAS5630 supporting single channel audio amplification. Single channel is capable of outputting nominal power simultaneously and continuously. It's suitable for amplifier enthusiasts or hobbyists to finish a complete amplifier system. Resistance and capacity components of high quality, including X7R ceramic capacitors, Metallized Polyester (PET) Capacitors and lower ESR electrolytic capacitors, high performance inductors are used to gain the perfect timber, finally realize high S/N ratio, low THD+N, wide frequency response range etc.

FIGURE 1-1 FRONT VIEW



1.2 Accessories

We don't provide audio accessories together with this product. Please go to www.sure-electronics.com to choose what you need.

Note: The diagrams above are used for reference only.

1.3 Features

- ✓ A perfect "Class D" architecture
- ✓ Frequency response: 20Hz to 20KHz(±3dB)
- ✓ Four selectable, fixed gain settings of nominally 23 dB, 29dB, 33 dB and 35dB.
- ✓ Single end audio signal input
- ✓ Under voltage protection
- ✓ Over current protection
- ✓ Short Circuit and Over Temperature Protection

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- Click & Pop Noise Reduction
- 2 speed Fan. Speeding up when the temperature of the chip rises above 125 centigrade.

Note: If the fault condition persists, the protection circuit stays in shutdown until the fault is removed.

1.4 Applications

- AV receivers
- Powered speakers
- Sub-woofers
- Musical Instrument amplifiers
- PA System
- External Car Speaker System
- Background Music Systems
- Home DIY
- Prototype for recording studios, post-production, live sound and hi-fi applications.

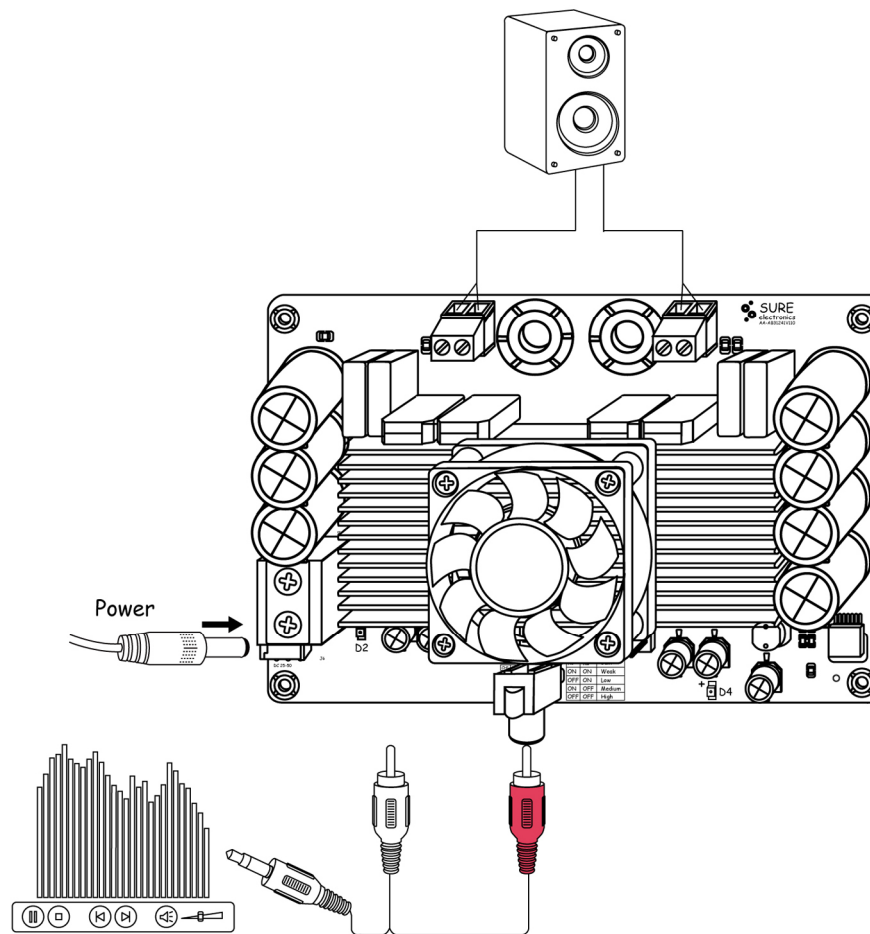
1.5 Benefits

- Mounting holes facilitate installation and fixing
- Several wiring methods facilitate connection: RCA Socket (Default), Terminal Block(Optional)
- Excellent heat dissipation eliminates the requirement of an extra heat sink.

1.6 Quick Start

Suggested connection is shown in figure 1-3. Before using RJ135T terminal blocks to power the board, please make sure the polarity is correct. A 50V, 12A supply with negative outside and positive inside is required.

FIGURE 1-3 CONNECTION SCHEMATIC



Note: Please observe the following steps to complete verification so as to ensure the products are intact during transit.

1. Open the amplifier package and make sure the product is intact (No missing or damaged components and no deformation).
2. Please observe the connection schematics when connecting the amplifier board. Use a nearby sound source, such as MP3 or CD player to have a trial. This amplifier board can be deemed as qualified if you can hear the sound corresponding to that sound source
3. It's suggested to make sure the polarity of the wires first and then connect the audio cables, wires. Turn down the output to the lowest and then power the board.

Chapter 2. Hardware Detail

2.1 Power Connection

To power the amplifier board, use either jack J6 or terminal blocks J5. Pay attention to the polarity when connecting power supply.

FIGURE 2-1 POWER CONNECTION

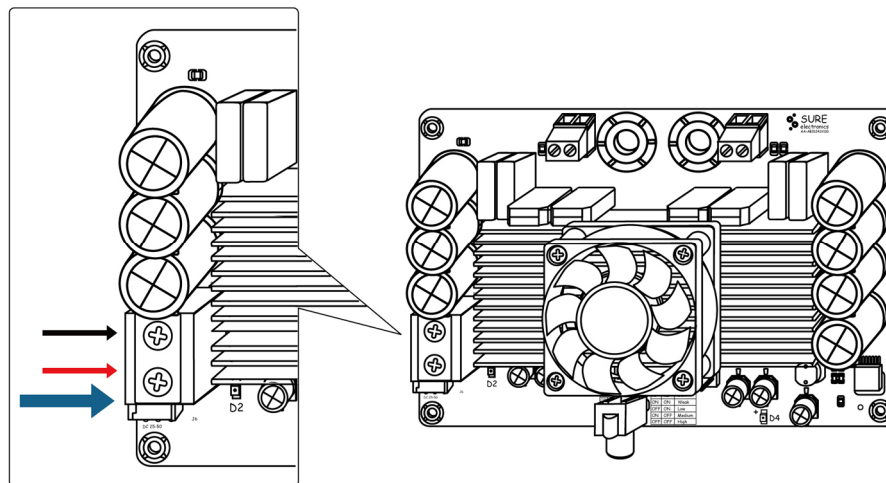


TABLE 2-1 POWER CONNECTION

Connector Mark		Description
Jack	J6	DC power supply socket
Terminal Blocks	J5	VCC The positive of power supply socket
		GND The negative of power supply socket

TABLE 2-2 Recommended Supply Voltages

Voltage Limitations	Maximum Current Requirement
25 to 50 V	16A

48V 12.5A switching power supply is recommended for common applications.

Note:

1. You are allowed to use only one way to power the amplifier board at a time.
 2. You're suggested to use AWG16 power cord. The length of power cord must be minimized. Increasing length of PSU cable is equal to increasing the distortion for the amplifier at high output levels and low frequencies.
- 48V 12.5A switching power supply is recommended if you just use this product to listen to the music.

2.2 Input Connections

You may use RCA connectors to input audio signal.

FIGURE 2-2 INPUT CONNECTION

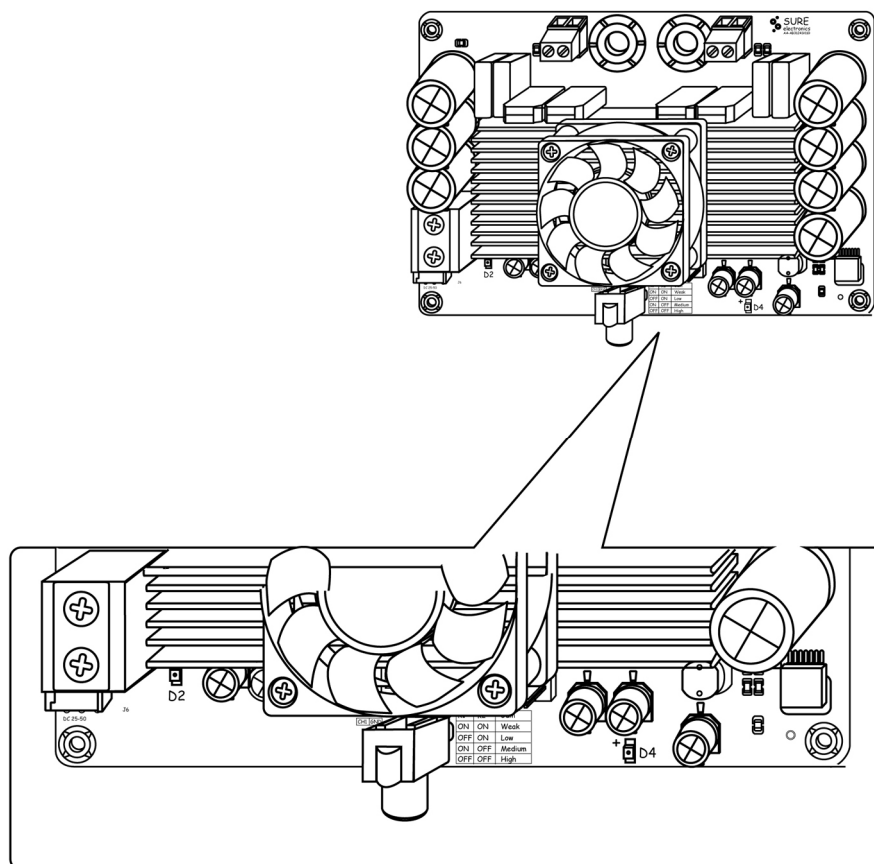


TABLE 2-2 INPUT CONNECTION

Connector Mark		Channel Description
RCA connector	J15	Audio Input
Terminal Blocks (Optional)	J1	Audio Input
		GND

Note: You are allowed to feed only one signal to the amplifier board at a time.

2.3 Output Connections

You can use either terminal blocks or banana connectors(optional) to output audio signal.

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FIGURE 2-3 OUTPUT CONNECTION

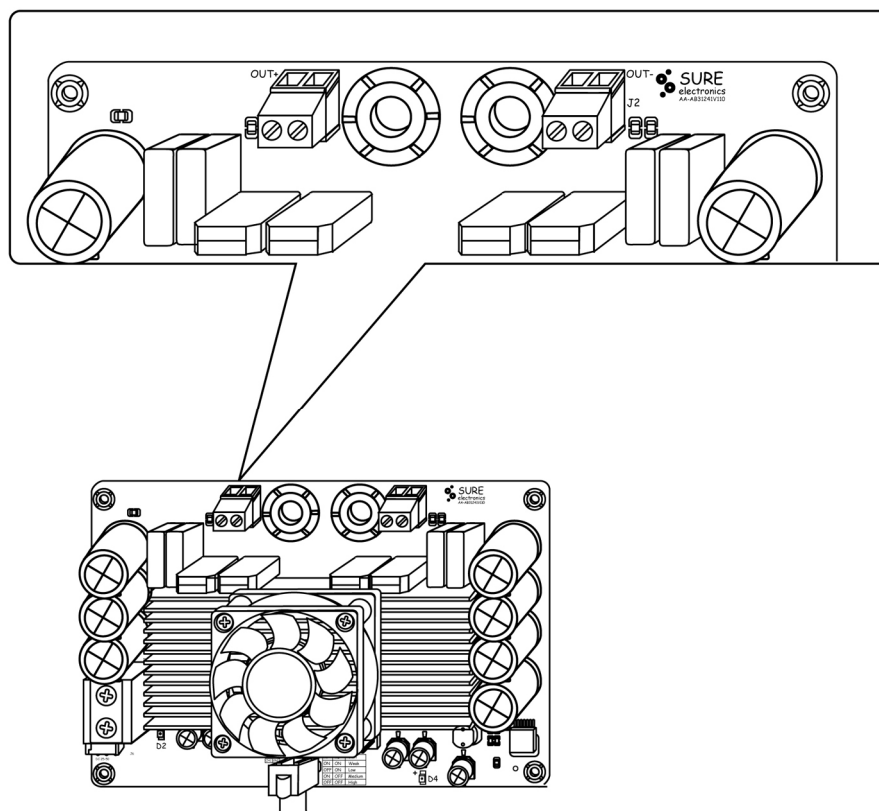


TABLE 2-3 OUTPUT CONNECTION

Connector Mark		Description
Terminal blocks*	J3	Positive Output of Audio
	J2	Negative Output of Audio
Banana Connectors (Optional)	J4	Banana Connectors

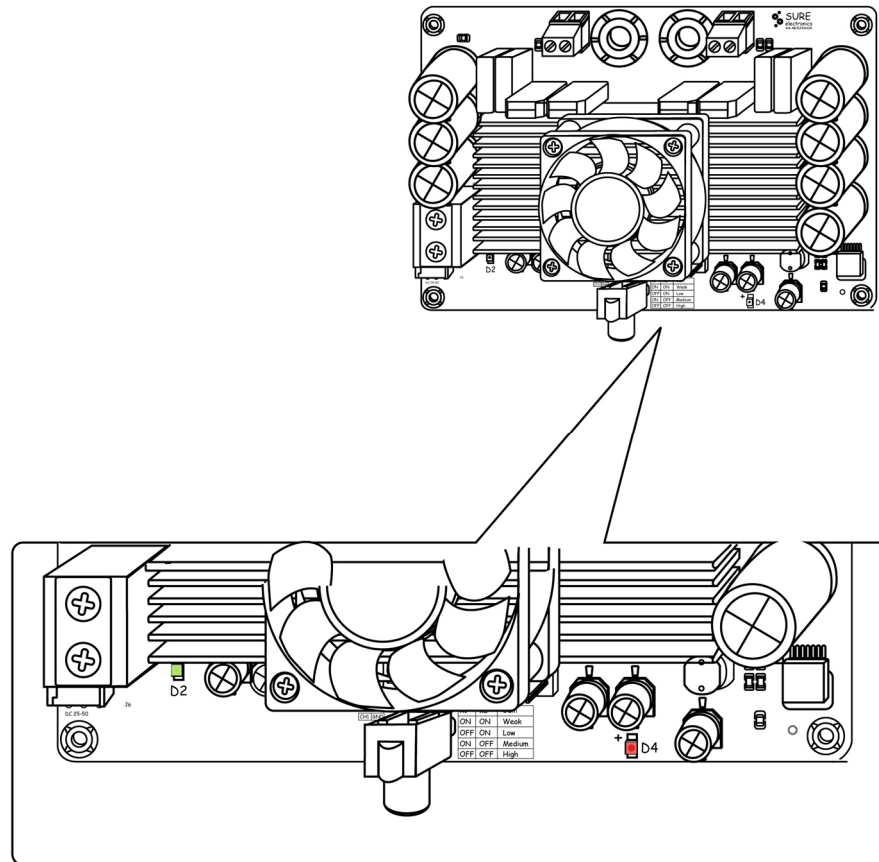
Note:

1. Never connect more than one group of speaker to the audio output
2. Refer to on-board descriptions for connection details.
3. Both positive and negative speaker outputs are floating and may not be connected to ground (e.g., through an oscilloscope).

2.4 LED Indicators

This amplifier has 2 power LED indicator which is marked as “PWR (D2)” and “125 degree C(D4) “. “Power (D2)” will be illuminated in green when power-up. “125 degree C (D4) “will be illuminated once the temperature of TAS5630 reaches up to 125 degrees centigrade, at the same time the fan speeds up.

FIGURE 2-4 LED INDICATOR



2.5 Gain Setting

You may also adjust the gain by setting the DIP switch SW1, SW2. The gain is factory pre-set to low. This can prevent chip from permanent damage caused by overheat when input signal amplitude is over range. On the other conditions of gain setting, it is recommended that the output signal amplitude is no larger than the power supply voltage once the input signal reaches the peak.

For example, the maximum amplitude of the input signal is no more than 615mV RMS when power supply voltage is 50V, load impedance is 2 ohm and the gain is set at 35 dB.

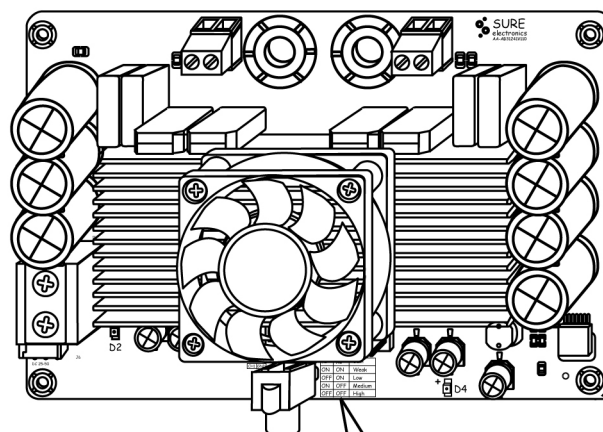
The other circumstances can be referred to the input sensitivity from [TABLE 3-1](#)

ELECTRICAL CHARACTERISTICS

Never adjust the gains when the amplifier is working, or TAS5630 will be damaged because of the instantaneous voltage. The instantaneous energy will exceed the rated power of a speaker and damage it. When adjust gain, please set SW1, SW2, SW3 and SW4 in the same way to make sure the same gains.

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FIGURE 2-5 VOLUME CONTROL



SW1,SW2 Setting

K1	K2	Gain
ON	ON	Weak
OFF	ON	Low
ON	OFF	Medium
OFF	OFF	High

TABLE 2-8 DIP SWITCH SETTING

Switch	K1	K2	Gain Status(dB)
SW1, SW2	ON	ON	Weak
	OFF	ON	Low
	ON	OFF	Medium
	OFF	OFF	High

2.6 Notes

In order to protect amplifier board and extend its service lifetime, please read the following warnings carefully since warranties will be voided if you do not observe the following warnings:

Warning 1:

Quality-related issues caused by potentiometers installed by buyers.

Warning 2:

In order to achieve a better sound quality, please use stable power supply since a bad or unstable power supply may worsen the sound quality or even cripple the amplifier board.

Warning 3:

Never equip a pre-amplifier to the audio input since the amplifier itself has powerful amplification ability and a high signal input will burn out the amplifier chip.

Warning 4:

In order to protect amplifier and speaker, please turn the volume output to the minimum when hooking up the amplifier and you may readjust the volume when you are sure that the amplifier is functioning properly.

Chapter 3. Electrical Characteristics

Following table lists all typical data of the Amp board. For full specification, please refer to the data sheet of TI's TAS5630 chip.

TABLE 3-1 ELECTRICAL CHARACTERISTICS

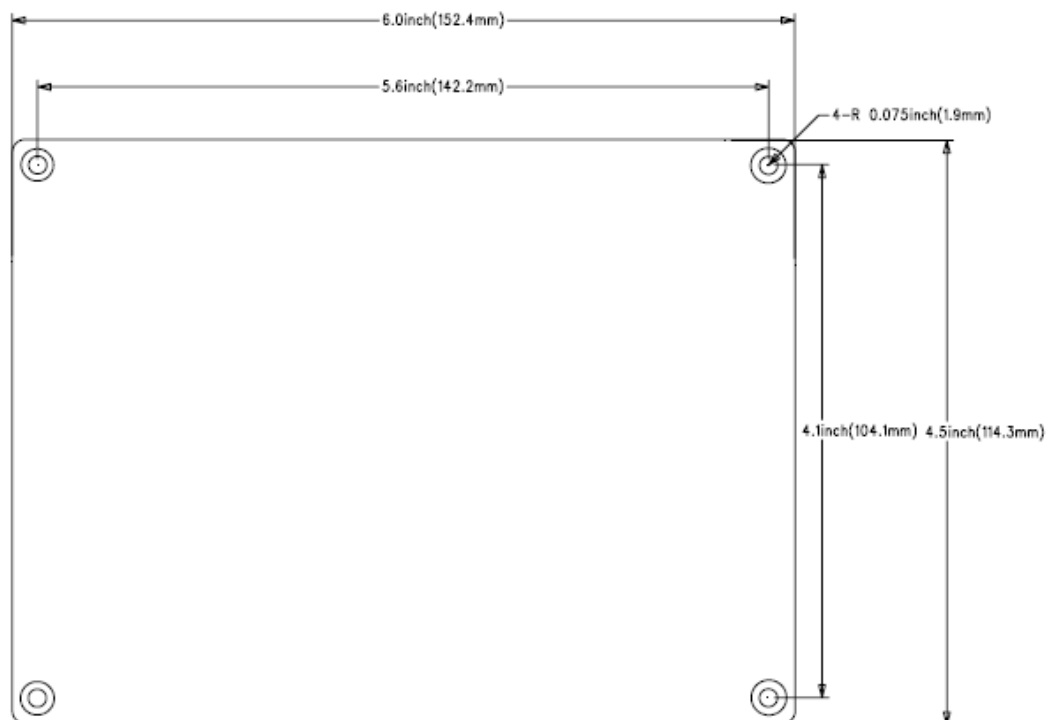
Parameter	Condition	Min.	Typ.	Max.
Supply Voltage	AA-AB31241	25V	50V	52.5V
Quiescent Current (Powered by 50V)	FAN ON	-	100mA	-
Input Sensitivity (AA-AB31241)	23 dB(gain)	-	2450mV	-
	29 dB(gain)	-	1230mV	-
	33 dB(gain)	-	775 mV	-
	35 dB(gain)	-	615mV	-
Gain(SW1 Setting)	K1 ON, K2 ON	-	23	-
	K1 ON, K2 OFF	-	29	-
	K1 OFF, K2 ON	-	33	-
	K1 OFF, K2 OFF	-	35	-
Frequency Range	-	20Hz to 20KHz (± 3 dB)		
Efficiency	-	-	>90%	-
Input Impedance	-	13Kohm	-	16.7K ohm
Load	600w 10%THD+N, clipped output signal	-	2 ohm	-
	400w 10% THD+N, clipped output signal	-	3 ohm	-
	300w 10% THD+N, clipped output signal	-	4 ohm	-
Operating Temperature	-	0°C	20°C	50°C
Storage Temperature	-	-20°C	20°C	105°C
Thermal Shutdown	-	-	155°C	-

Note:

1. Stresses beyond the listed maximum power supply voltage may cause the permanent damage to components on board.
2. The input sensitivity values are calculated on the basis of 2 Ohm load.

Chapter 4. Mechanical Drawing

FIGURE 4-1 MECHANICAL DRAWING



Chapter 5. Contact Us

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